

motions, with suitable illustrations, are fully explained. On "beating-up," the author has some instructive information respecting the movement of the crank for carrying the batten or going part against the fell of the fabric. He supplies a table showing the motion of the crank, and treats of the length of the crank-arm and the eccentricity of movement. The concluding portions of the book are devoted to west-stop motions, mechanism for governing the warp and taking-up of the fabric, the construction of temples and selvage motions. There is also a chapter on the arrangement of weaving-rooms or sheds, with a plate illustrative of the positions of the looms and other machinery. The book should be in the possession of all those interested in the construction of power looms.

#### OUR BOOK SHELF.

*Leçons d'Optique géométrique à l'Usage des Élèves de Mathématiques spéciales.* Par E. Wallon, Professeur au Lycée Janson-de-Sailly. Pp. 343. (Paris: Gauthier-Villars, 1900.)

THIS book has been written at the desire of Prof. Wallon's students, to whom a graceful tribute is paid, in the preface, for the assistance which their questions, doubts and objections have rendered in developing the author's methods of teaching. To look on one's students as collaborators, that is certainly the secret of successful teaching; and, as here presented, Prof. Wallon's lectures are certainly successful in giving a systematic and clearly defined outline to the science of geometrical optics. The diagrams are well drawn and numerous, and the mathematical proofs are simple and yet sufficient. There is, however, little that is novel to be found in the course of these lectures; indeed, in a few cases it might be objected that there was a tendency to lag behind the times. Thus, in discussing refraction equivalents, Newton's law, that  $\frac{n^2 - 1}{d} = \text{constant}$ , and Gladstone and Dale's law, that  $\frac{n - 1}{d} = \text{constant}$ , are alone mentioned ( $n$  being the refractive index, and  $d$  the density of the substance). Lorenz's law, that  $\frac{n^2 - 1}{(n^2 + 2)d} = \text{constant}$ , is now most generally accepted. For gases, in which  $n$  is nearly equal to unity, all three laws hold with about equal accuracy. But Lorenz's law appears to hold in passing from the gaseous to the liquid state, and must therefore be accepted as the most general.

An interesting chapter is devoted to the subject of the human eye, in which the most well known optical properties of that organ are discussed. In the ensuing chapter, on optical instruments, a particularly good account is given of the optical systems comprised in telescopes and microscopes of various patterns. It is surprising, however, that the ophthalmoscope and ophthalmometer are not mentioned, and are in fact so seldom found described in works on geometrical optics. Both instruments involve interesting optical arrangements, and their practical usefulness would render a description of their details still more interesting.

E. E.

*Therapeutic Electricity and Practical Muscle Testing.* By W. S. Hedley, M.D., M.R.C.S. England. Pp. ix + 278; 3 plates; 99 illustrations. (London: J. and A. Churchill, 1899.)

THE increased use of electro-therapeutic methods renders the appearance of Dr. Hedley's book welcome. The profession have for some time looked somewhat askance at this departure in therapeutics, and are, in many branches of this practice, rather inclined to regard the good effect

of the treatment as moral and not actual. The work before us considers the whole subject from a scientific standpoint, and any one interested in it will gain considerable profit from its perusal.

The reader must be warned at once that the book contains no mention of radiography or the application of the Röntgen rays to the healing art, either from a diagnostic or therapeutic standpoint. The author, in his preface, admits that the work is a therapeutical one, and to some extent apologises for the description of such instruments as the cystoscope, &c. No doubt he thinks the profession is in possession of sufficient literature upon the subject of radiography, which may or may not be true; the sphere of usefulness of the book would, however, certainly have been increased by the inclusion of this subject.

The work is divided into three parts. The reason for this classification is not quite evident; a part as a classification unit seems, in the author's hands, to differ to no material extent from a chapter. Further, each part is chaptered separately, which, without some very special object is to be gained, is a bad plan; from this it follows that the book contains three Chapters i., &c.

The first part is mostly concerned with those general physical considerations which have a special bearing upon what the author in the first chapter of Part ii. calls the electro-therapeutic outfit. A good account is given in Chapter vii. (p. 65) of currents of great frequency and high potential, which, as has been frequently shown, are of great therapeutic value. Much technical detail is given, both of a purely electrical and electro-physiological character.

One of the most useful chapters from the standpoint of the general physician is Chapter v. Part ii., upon the action of muscles and the consequences of their paralysis. In Chapter x. Part iii., an interesting account of cataphoresis is given. Very frequent mention is made of authors' names and no reference added, nor is there an index of authors at the end, or anything in the shape of a bibliography. Mere chance or whim has apparently guided the author in giving or omitting the full reference of a work cited; in some cases the full reference of important monographs is withheld, in others that of trivial ones given. This method cannot be too severely deprecated.

To sum up our remarks, it is with the manner and not the matter of the book we find fault. It is full of useful and, indeed, essential information to those working in this field; the author has spared no pains to collect fact bearing upon and elucidating his subject.

*Lessons in Botany.* By Prof. George F. Atkinson, Ph. B. Pp. xv + 365. (New York: Henry Holt and Co., 1900.)

THE present volume is, in a sense, an abridged edition of an excellent text-book by the same author, which appeared a year or two ago. The subject-matter is carefully arranged to suit the convenience of teacher and pupil, and altogether the book is one which should prove useful in this country as well as in America. Naturally, from the British point of view, the difficulty of obtaining the needful specimens occasionally may turn up, though this would not recur very often. We can confidently recommend Prof. Atkinson's book to the notice of teachers.

*Outlines of Plant Life, with special reference to Form and Function.* By Prof. Charles Reid Barnes. Pp. vi + 308. (New York: Henry Holt and Co., 1900.)

THIS is a work intended for school use. It has some points of merit, especially the special part on ecology, in which the examples are well chosen and fully illustrated. The illustrations, though almost all are (with due acknowledgment) borrowed from other works, are distinctly good. We think the book a useful one, and the exercises which are interspersed through the volume add to its value.